

FIG. 1

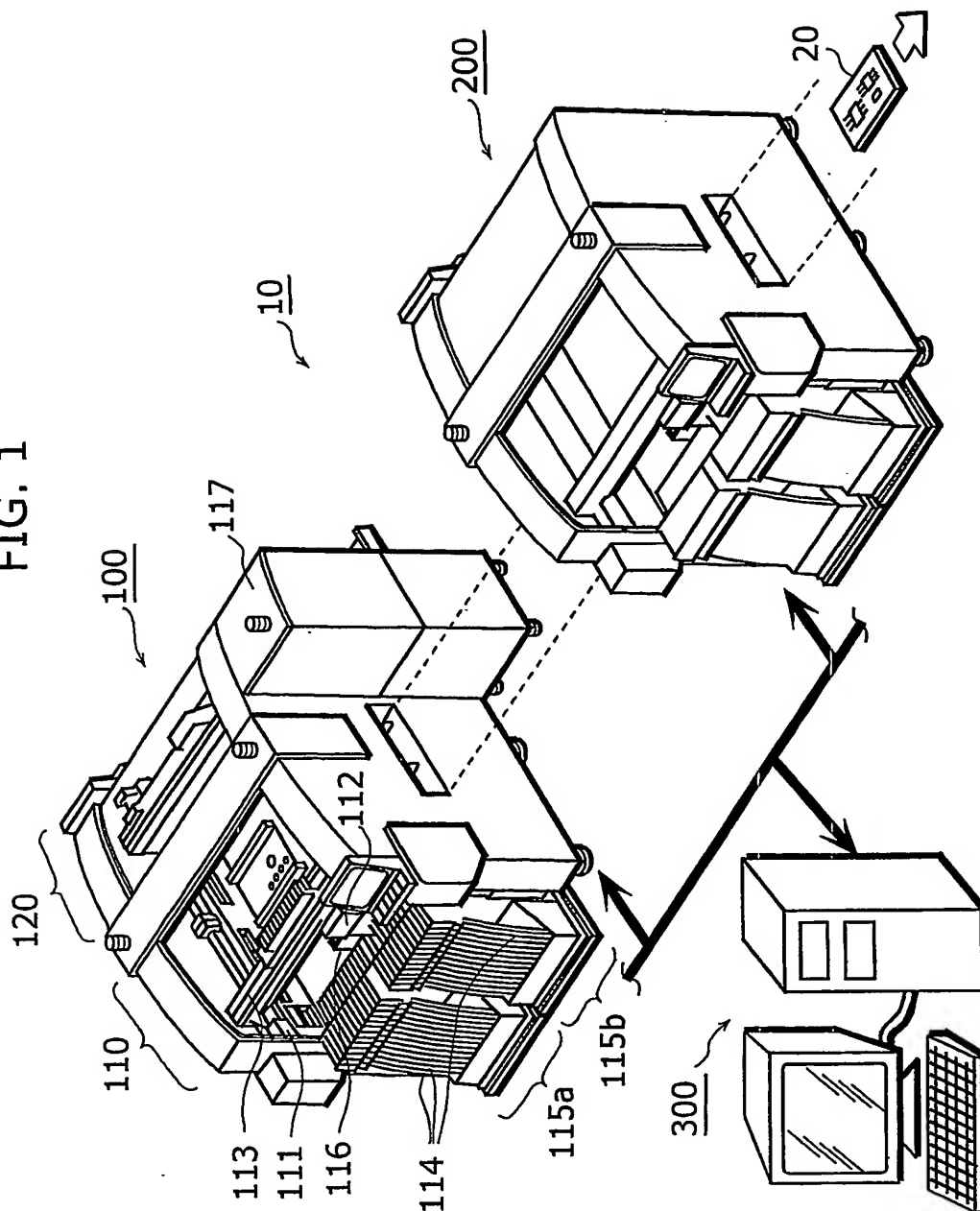


FIG. 2

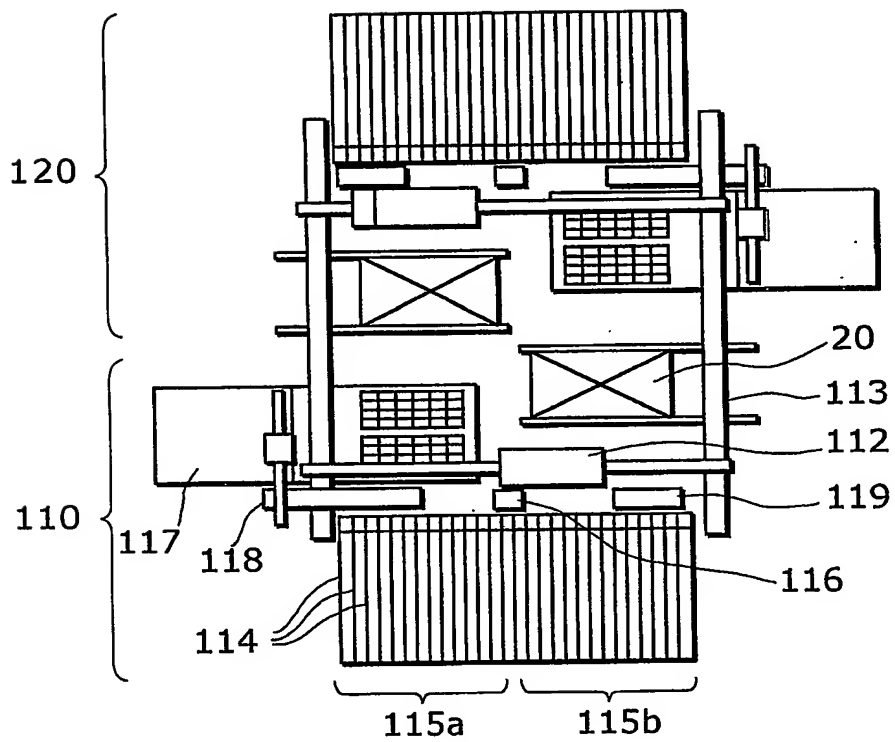


FIG. 3

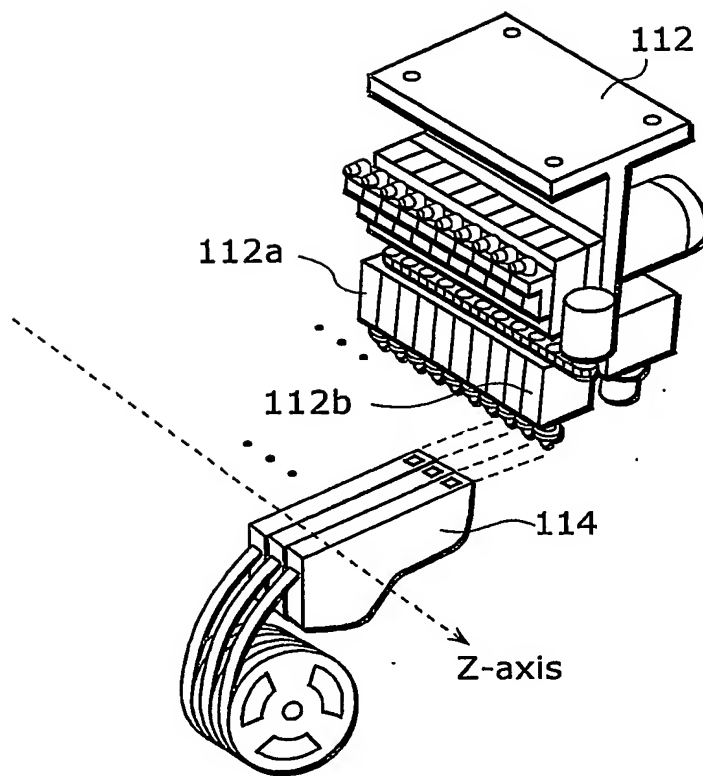


FIG. 4A

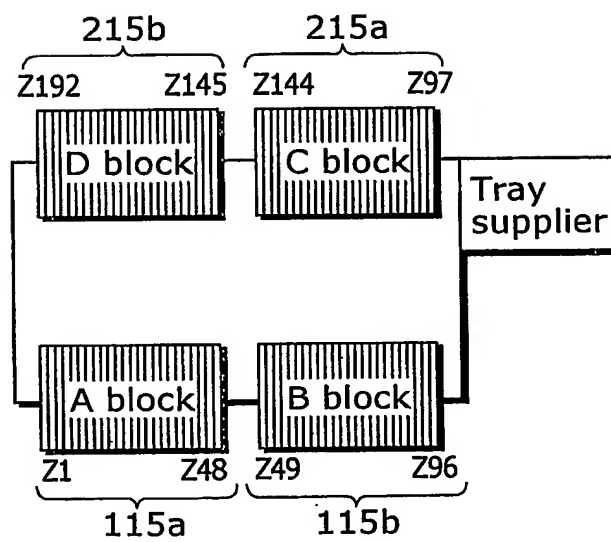


FIG. 4B

	A				B				C				D				
	Z1 Z48				Z49 Z96				Z97 Z144				Z145 Z192				
	Z1	Z3	Z45	Z47				Z49	Z51	Z93	Z95						
				No. of tapes						No. of tapes					No. of tapes		

FIG. 5A

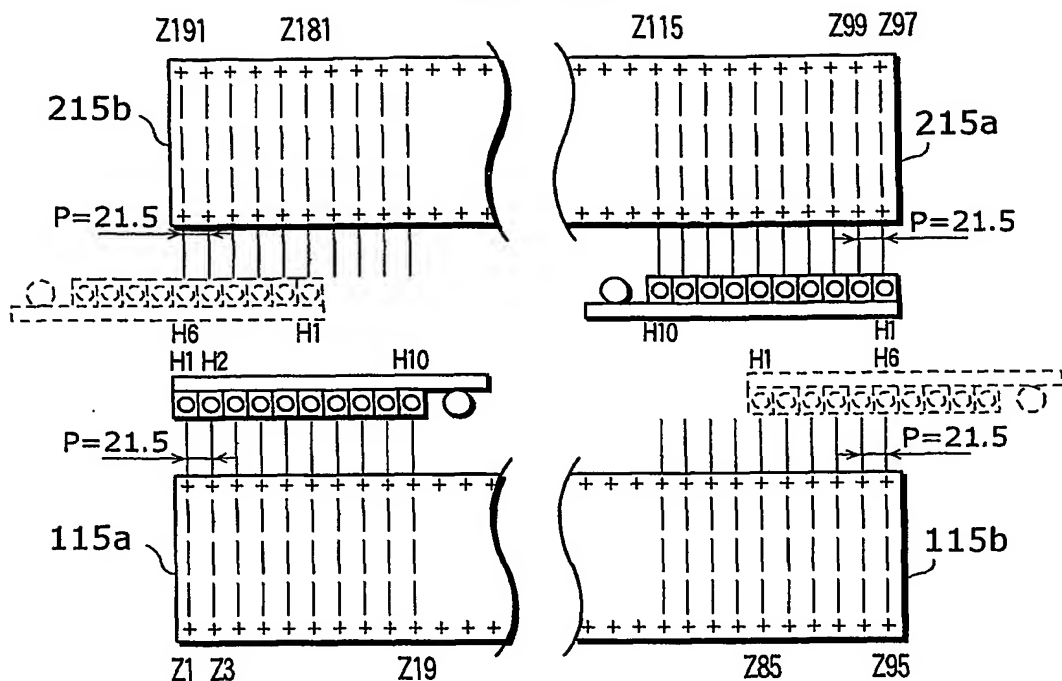


FIG. 5B

10 nozzle heads	Inner side	Z1 Z2	Z3 Z4	Z5 Z6	Z7 Z8	Z9 Z10	Z11 Z12	Z13 Z14	Z15 Z16	Z17 Z18	Z19 ~ Z86	Z87 Z88	Z89 Z90	Z91 Z92	Z93 Z94	Z95 Z96
	Outer side	Z97 Z98	Z99 Z100	Z101 Z102	Z103 Z104	Z105 Z106	Z107 Z108	Z109 Z110	Z111 Z112	Z113 Z114	Z115 ~ Z182	Z183 Z184	Z185 Z186	Z187 Z188	Z189 Z190	Z191 Z192
Heads (Nozzles)	H1	○	○	○	○	○	○	○	○	○	○	—	—	—	—	—
	H2	—	○	○	○	○	○	○	○	○	○	○	—	—	—	—
	H3	—	—	○	○	○	○	○	○	○	○	○	○	—	—	—
	H4	—	—	—	○	○	○	○	○	○	○	○	○	○	—	—
	H5	—	—	—	—	○	○	○	○	○	○	○	○	○	○	—
	H6	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○
	H7	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○
	H8	—	—	—	—	—	—	—	○	○	○	○	○	○	○	○
	H9	—	—	—	—	—	—	—	—	○	○	○	○	○	○	○
	H10	—	—	—	—	—	—	—	—	—	○	○	○	○	○	○

○ : Picking up possible

— : Picking up impossible

FIG. 6A

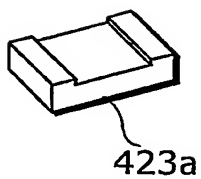


FIG. 6B

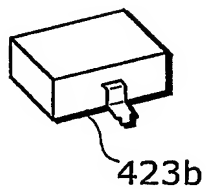


FIG. 6C

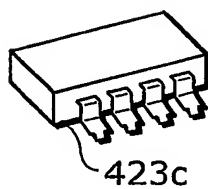


FIG. 6D

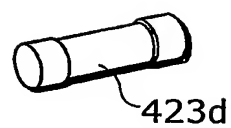


FIG. 7

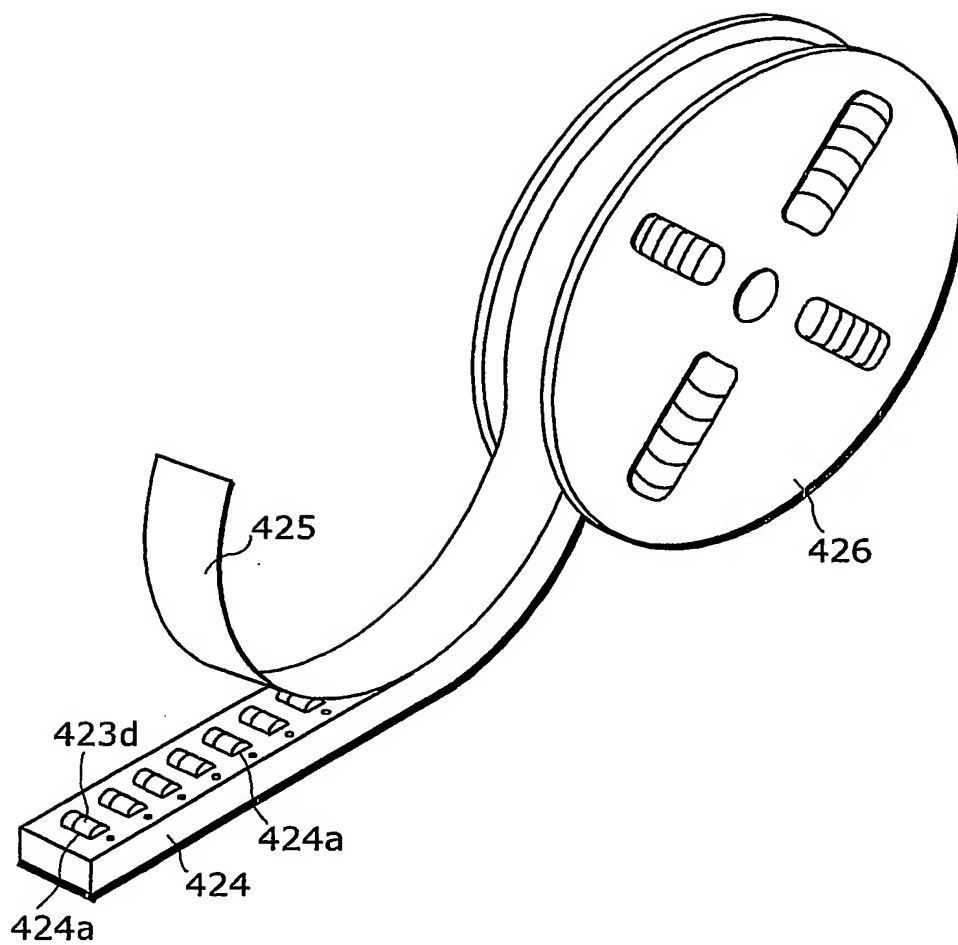
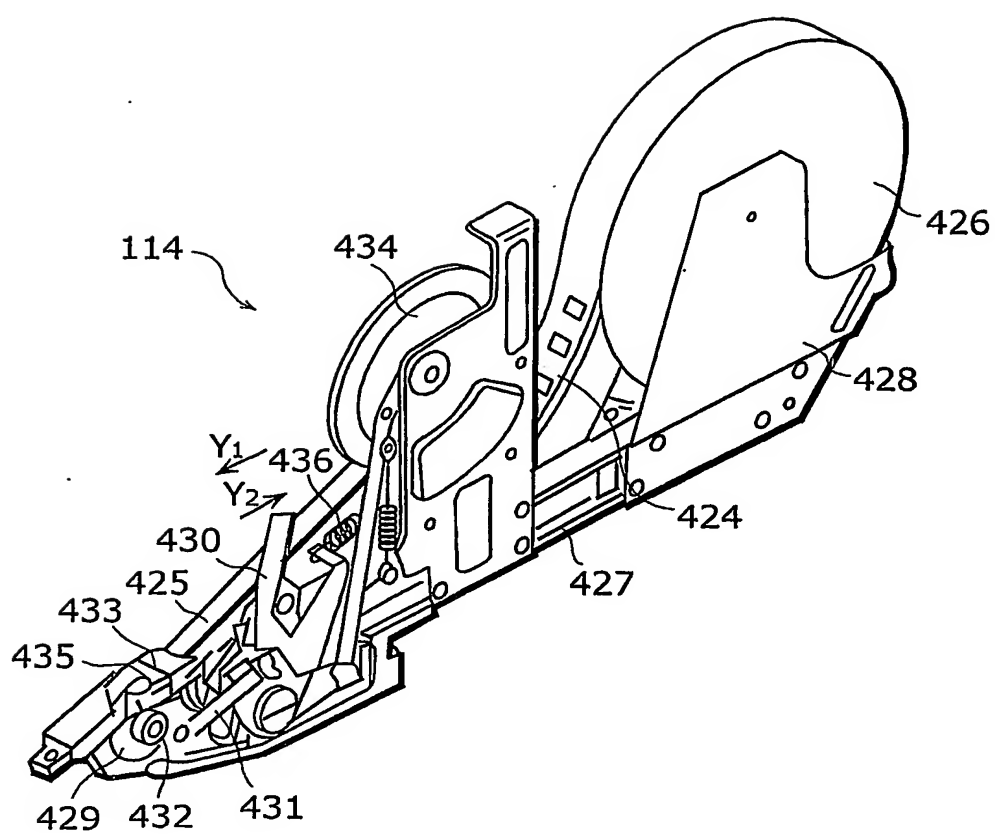


FIG. 8



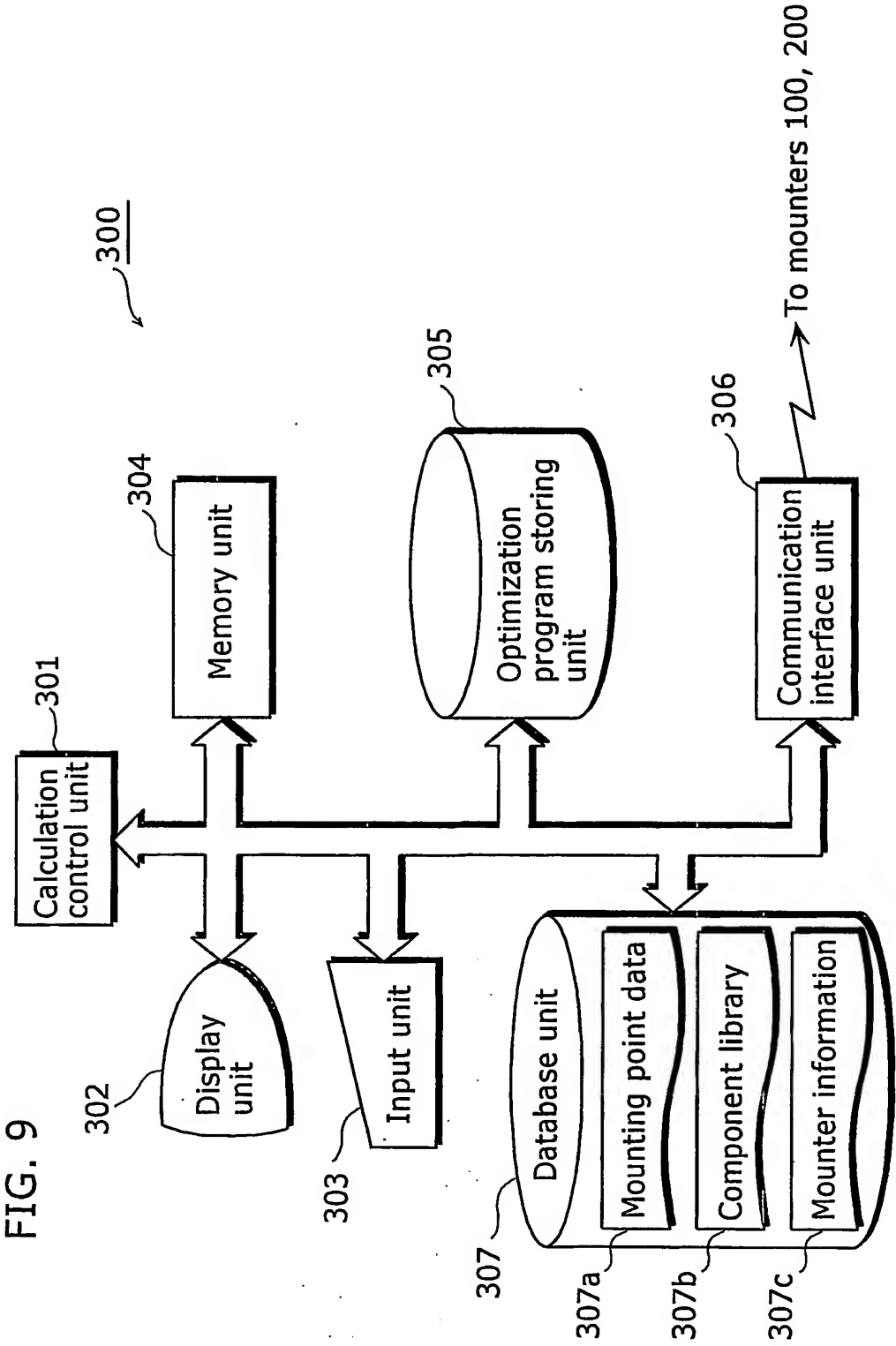


FIG. 10

307a

Mounting points $p_i = (\text{Component type } C_i, \text{ X coordinate } X_i, \text{ Y coordinate } Y_i, \text{ Mounting angle } \theta_i, \text{ Control data } \phi_i)$



NC data is a list of mounting points p_i

$$\text{NC data} = \begin{pmatrix} p_1 \\ p_2 \\ p_3 \\ \vdots \\ \vdots \\ \vdots \\ p_N \end{pmatrix} = \begin{pmatrix} c_1, x_1, y_1, \theta_1, \phi_1 \\ c_2, x_2, y_2, \theta_2, \phi_2 \\ c_3, x_3, y_3, \theta_3, \phi_3 \\ \vdots \\ \vdots \\ \vdots \\ c_N, x_N, y_N, \theta_N, \phi_N \end{pmatrix}$$

FIG. 11

307b










Component name	(Appearance)	Component size (mm)			2-D recognition method	Pick-up nozzle	Tact time (sec.)	Speed XY	
		X	Y	L					
0603CR		0.6	0.3	0.25	Reflection	SX	0.086	1	
1005CR		1.0	0.5	0.3-0.5		SA			
1608CR		1.6	0.8	0.4-0.8		S	0.094		
2012CR		2.0	1.25	0.4-0.8					
3216CR		3.2	1.6	0.4-0.8					
4TR		2.8	2.8	1.1		Cylindrical tip	0.11		
6TR		4.3	4.5	1.5					
1TIP		2.0	φ1.0	-					
2TIP		3.6	φ1.4	-					
1CAP		3.8	1.9	1.6		S	0.13	2	
2CAP		4.7	2.6	2.1		M			
3CAP		6.0	3.2	2.5					
4CAP		7.3	4.3	2.8					
SCAP		4.3	4.3	6.0		ML			
LCAP		6.6	6.6	6.0					
LLCAP		10.3	10.3	10.5					
1VOL		4.5	3.8	1.6-2.4		M			0.13
2VOL		3.7	3.0	1.6					
3VOL		4.8	4.0	3.0					

FIG. 12

307c

Unit ID	Head information	Nozzle information	Cassette information	Tray information
110	10 nozzle heads	SX,SA,...	96	8 levels
120	10 nozzle heads	None	96	None
210	4 nozzle heads	S,M,...	48	None

FIG. 13

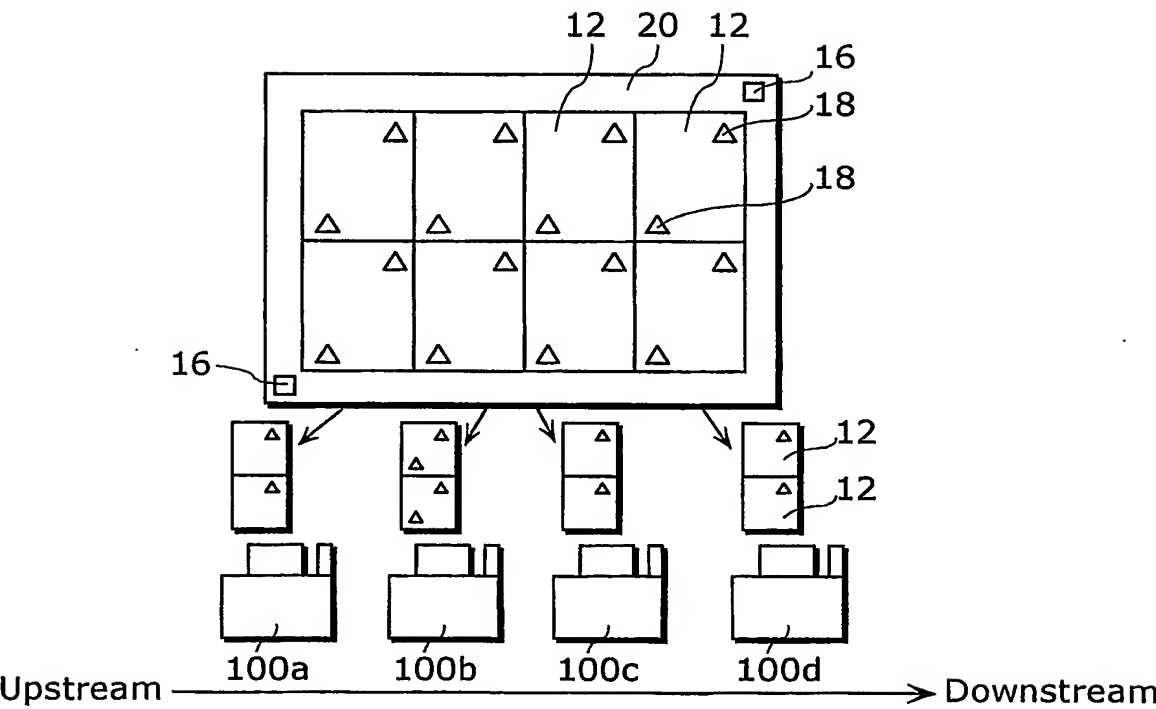


FIG. 14

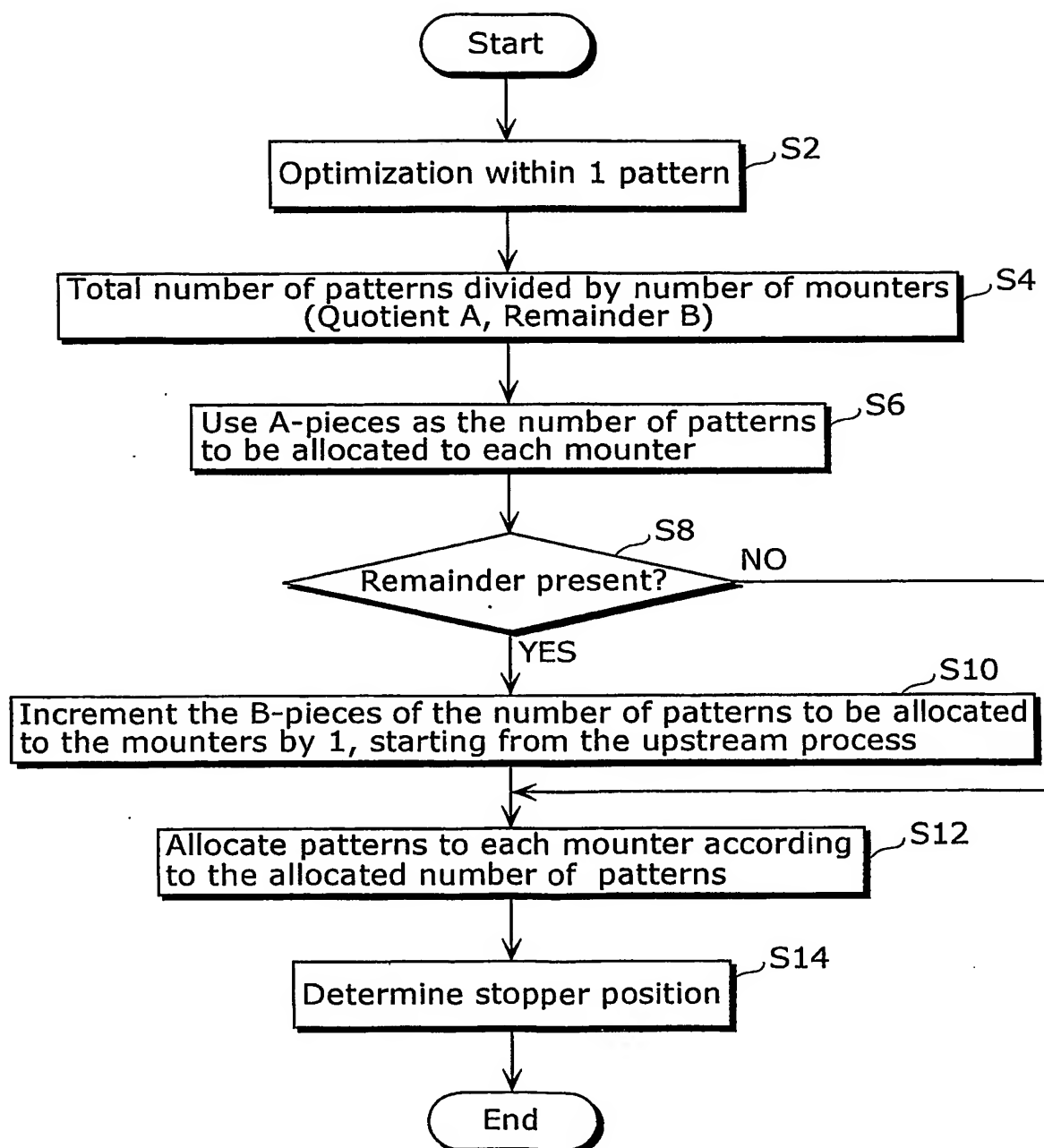


FIG. 15

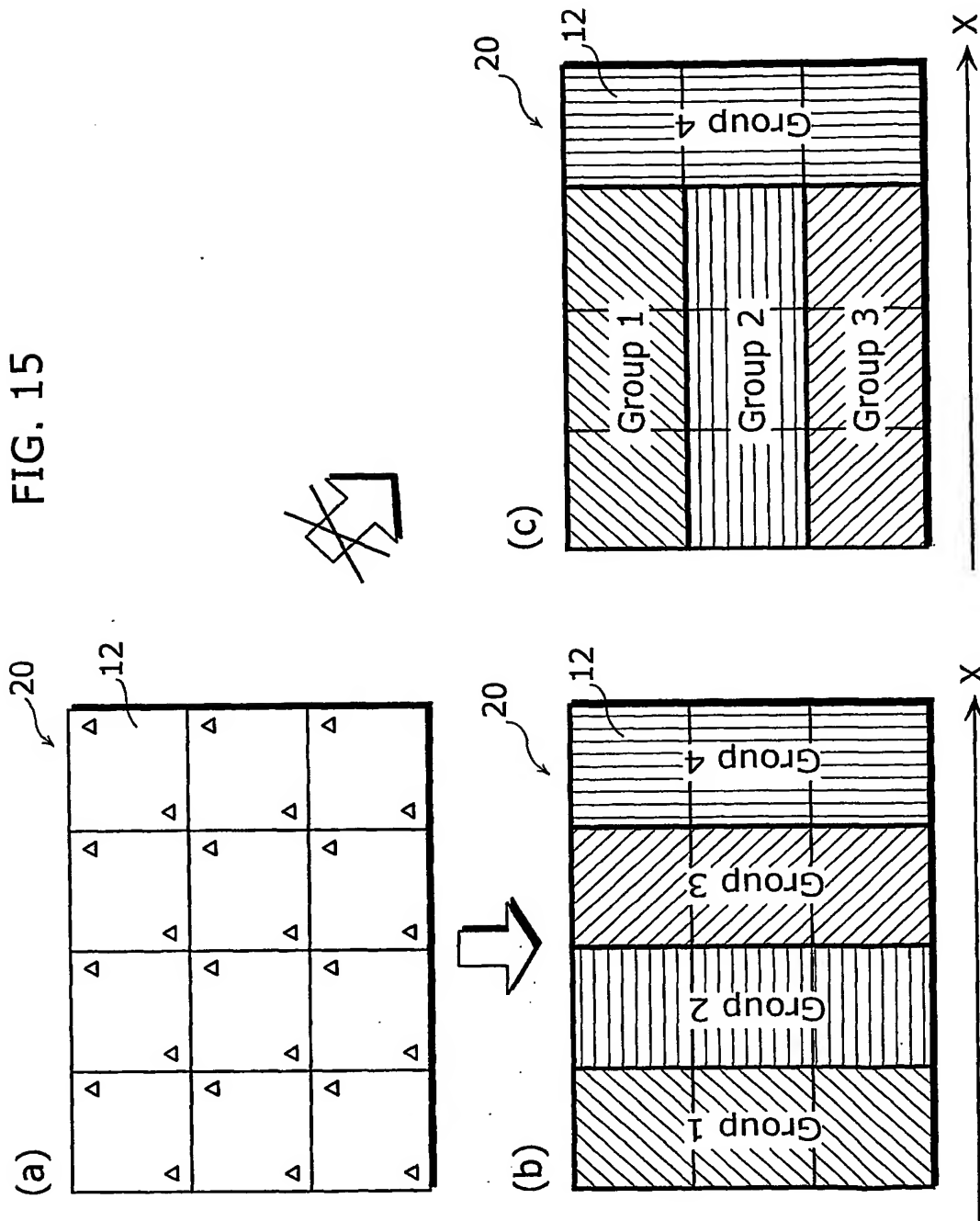
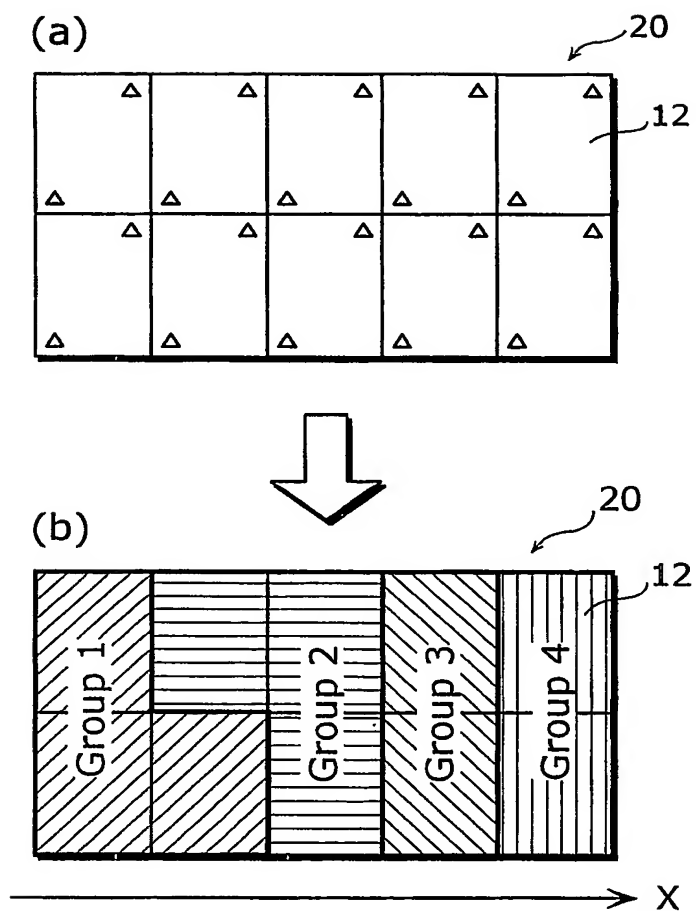


FIG. 16



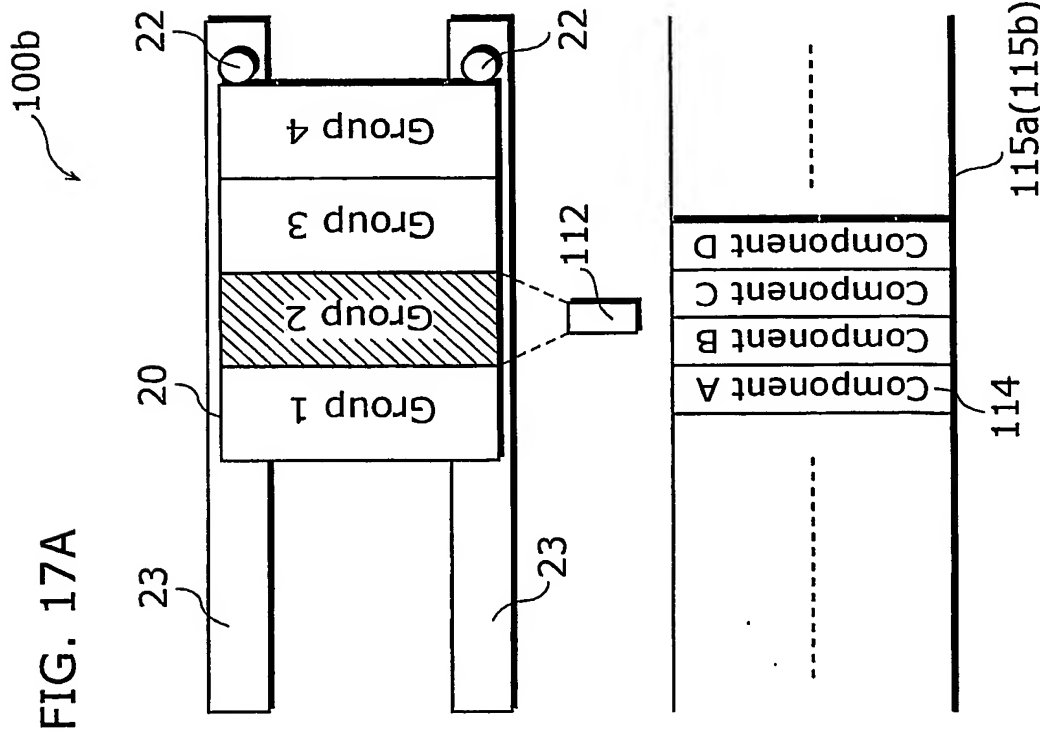
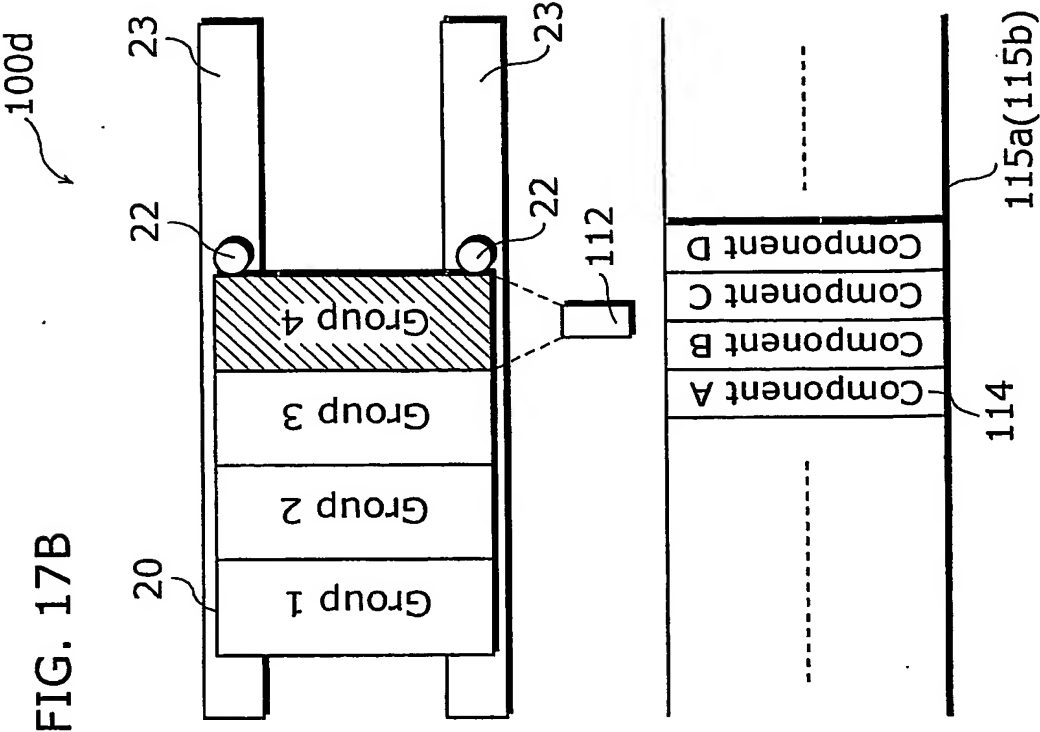
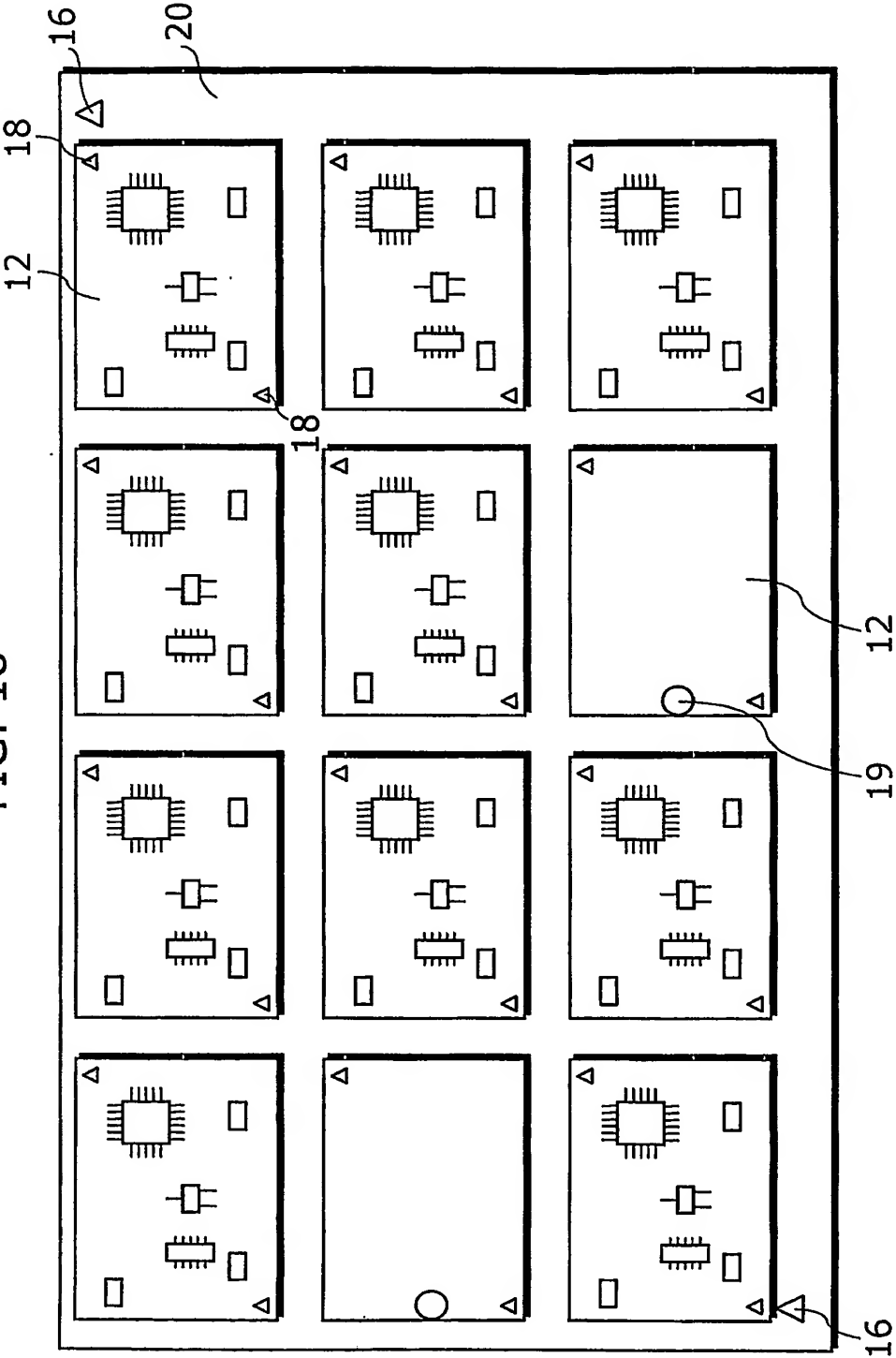


FIG. 18



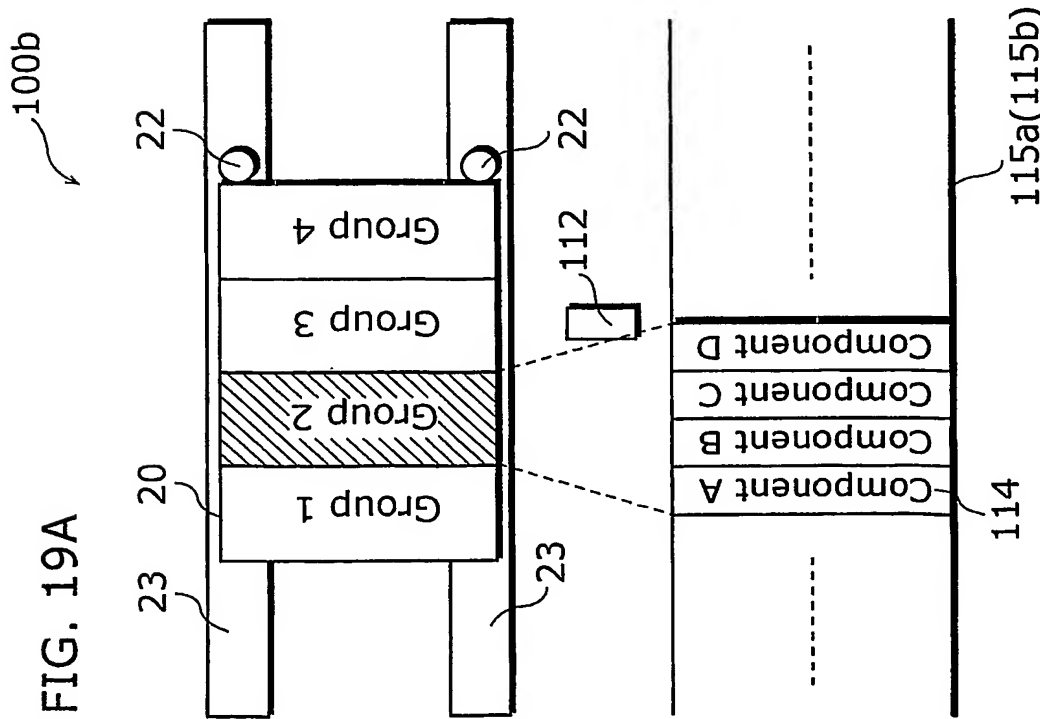
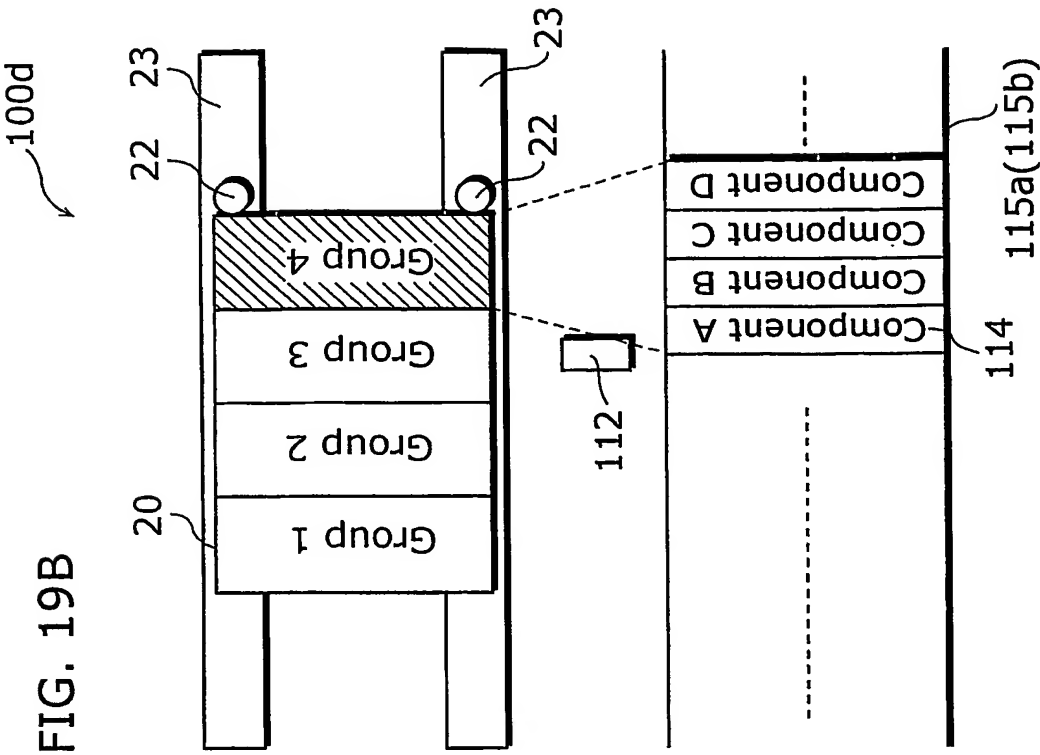


FIG. 20

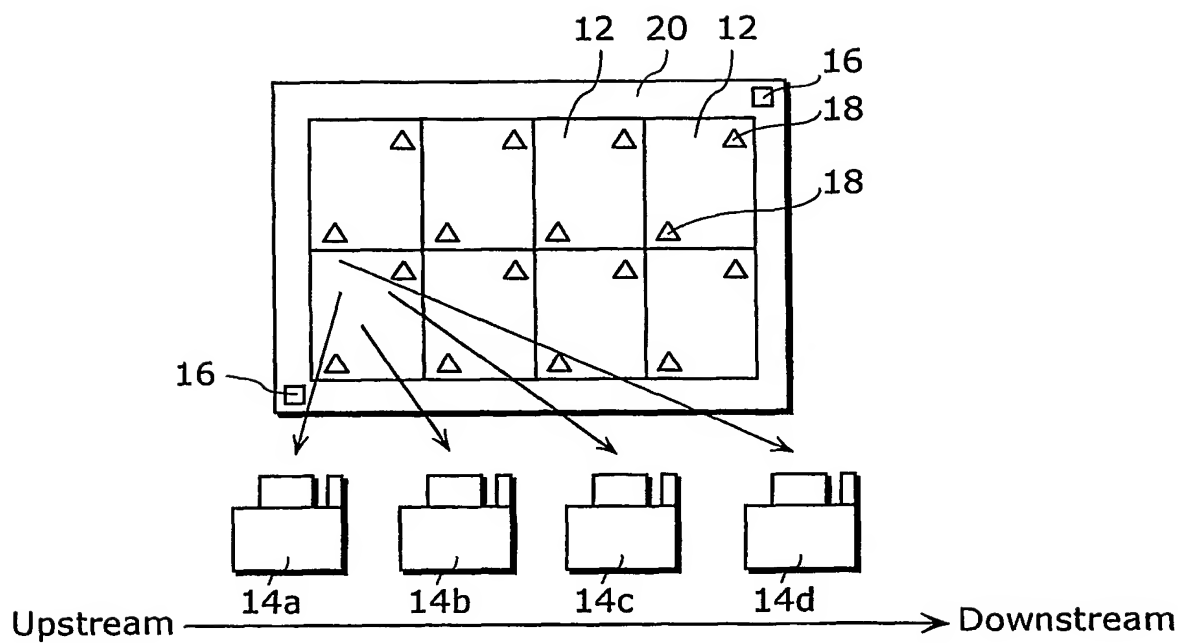


FIG. 21

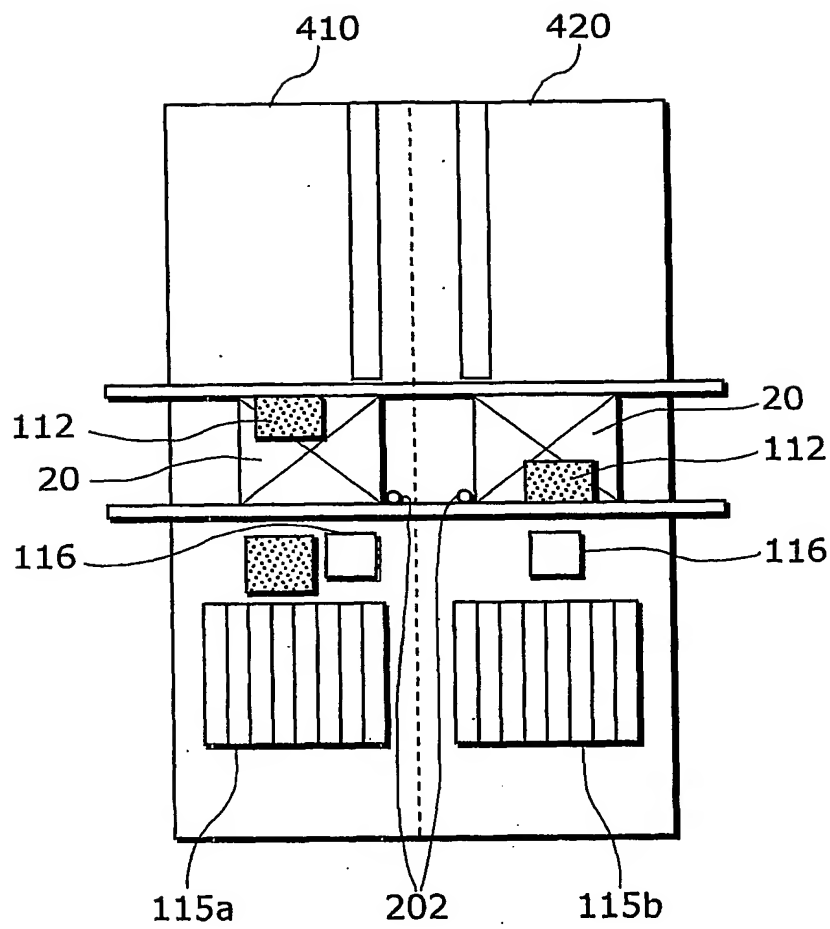


FIG. 22

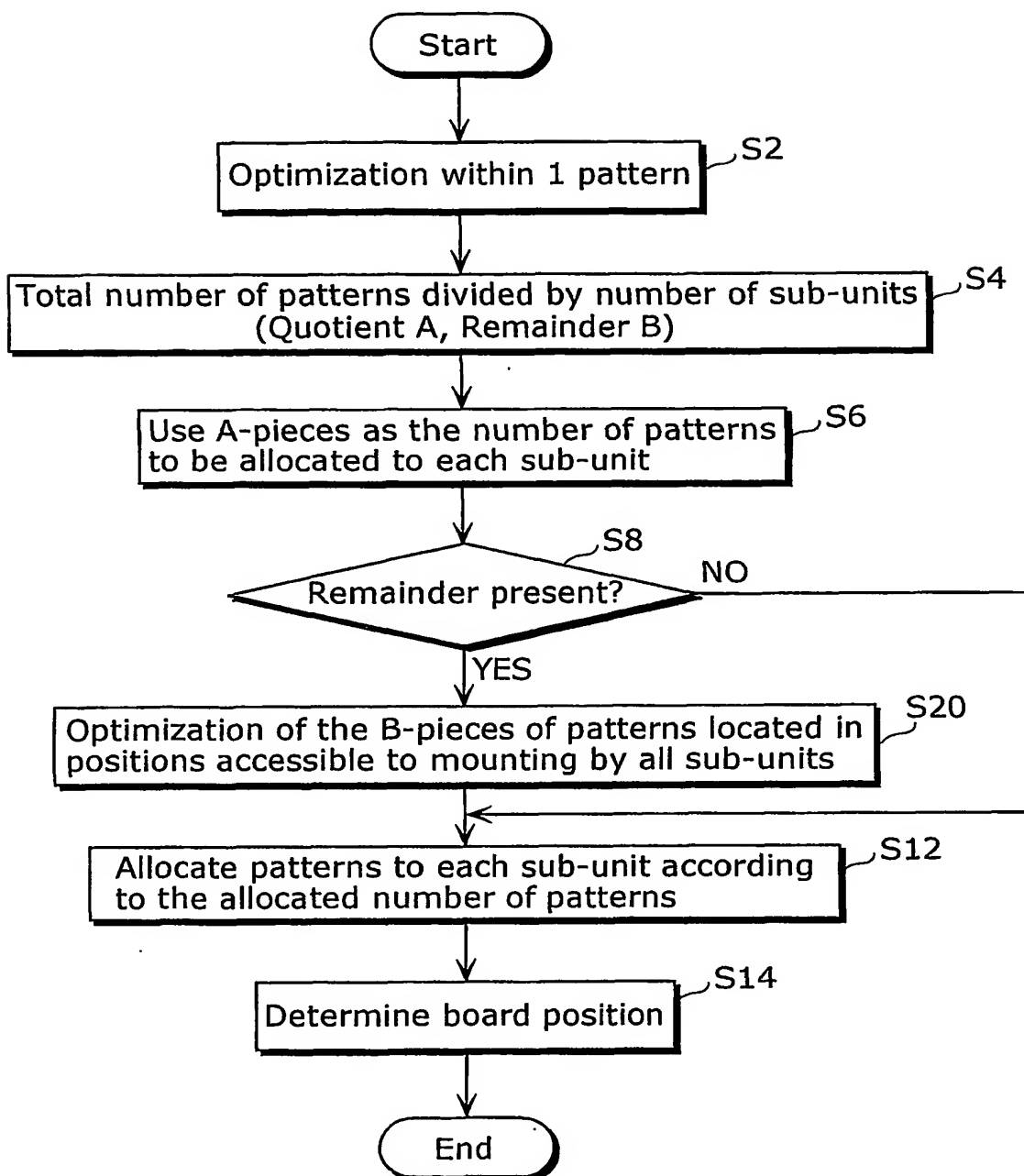


FIG. 23

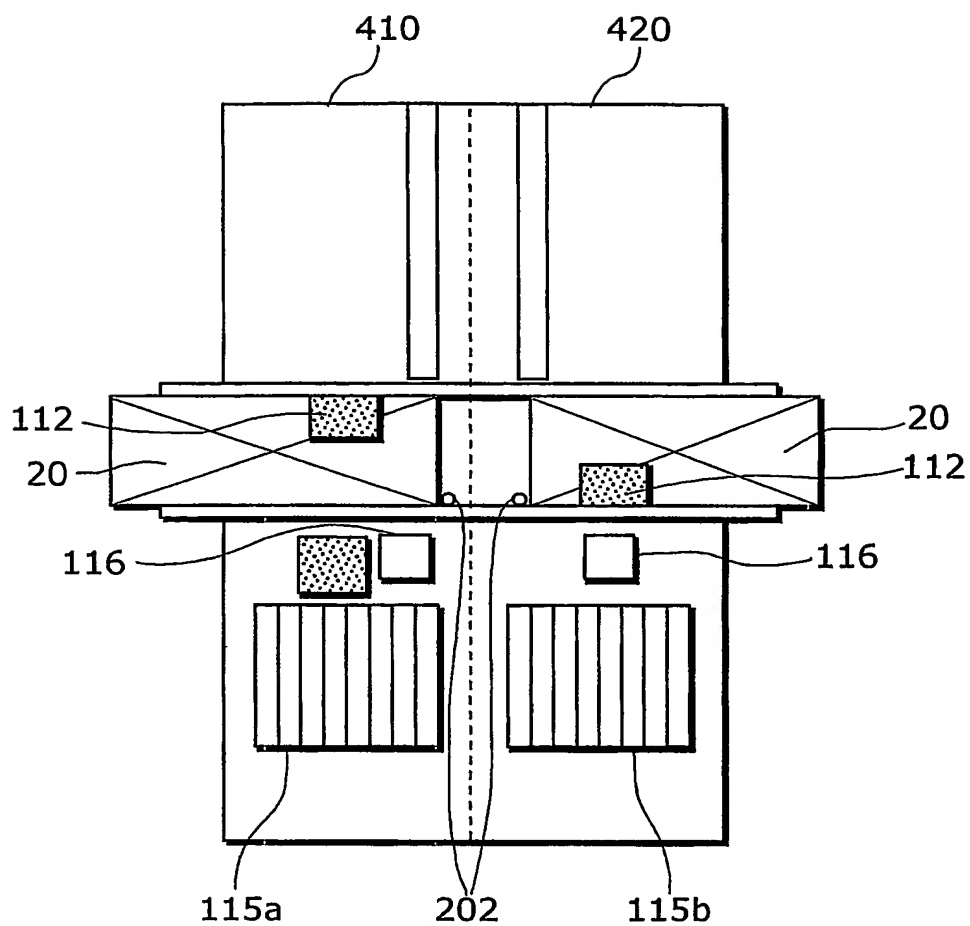


FIG. 24

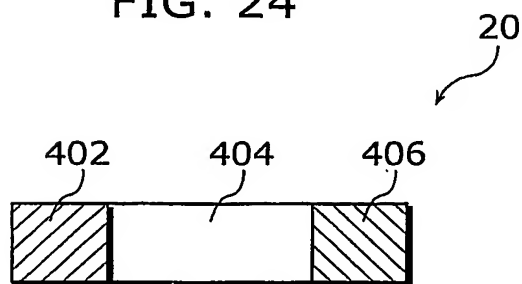


FIG. 25

